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NEW RECORDS OF TWO PULMONATE FRESHWATER GASTROPODS IN INDIA,
WITH DESCRIPTION OF A NEW SPECIES, *BULINUS INDICUS*¹

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(With six text-figures)

INTRODUCTION

Pulmonate snails of India are classified into four families namely, Lymnaeidae, Anaclydidae, Planorbidae and Physidae. The last mentioned family is hitherto represented in India by fossils. Among the other three families, Lymnaeidae and Planorbidae are common and their representatives occur attached to vegetation, submerged objects in lentic waters. The Indian representatives of the family Planorbidae are grouped under three subfamilies, namely Bulininae, Planorbinae and Segmentininae. The first mentioned includes two genera, the most common *Indoplanorbis* and the less common *Camptoceras* (Subba Rao 1989).

A small collection of aquatic molluscs from near Pune has turned out to be interesting and significant, as it adds a species new to India. *Bulinus prinsepilii* (*Physa prinsepilii*) was recorded from the Intertrappean beds of Deccan (Pascoe 1962). *Physa acuta*, a recent species was recorded from Pakistan. The oc-

currence of this species is reported for the first time from India.

The subfamily Bulininae is represented by four species in India (Subba Rao 1989). The genus *Bulinus* which is common and represented by several species in Africa is recorded for the first time in India. Several taxonomic investigations were carried out on the genus *Bulinus*. We do not have live material to study the anatomy but the shells are so distinct and different from other known species of the genus that we are inclined to identify the present material as a new species, *Bulinus indicus*. Thus both the species and genera are taxonomically important and are new records for India.

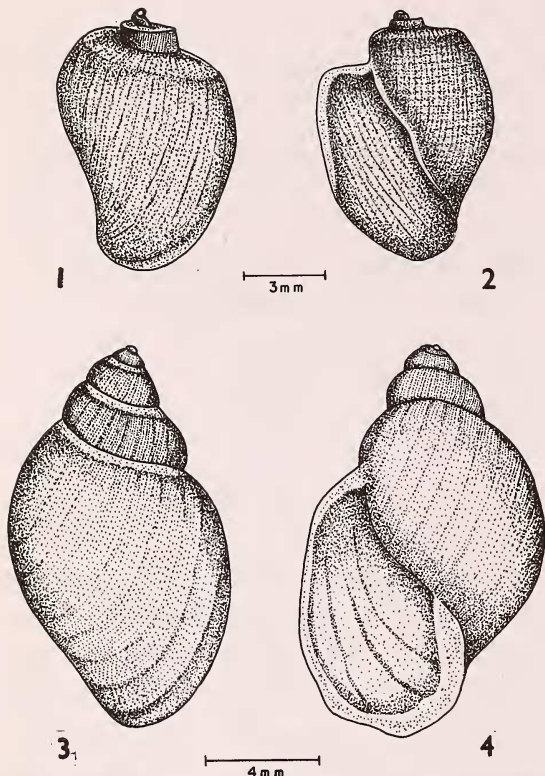
The occurrence of these two species in India has to be viewed with concern since both species have potentialities to act as intermediate hosts of schistosomes.

The species of *Bulinus* are known to be the intermediate hosts of blood flukes, specifically *Schistosoma haematobium*, *S. intercalatum*, *S. bovis* and *S. leiperi* infecting humans, cattle, sheep, goats, and equines (Malek and Cheng 1974). As reports of widespread, although localised, infection of *S. haematobium* among humans causing urinary schistosomiasis in

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Figs. 1-2. *Bulinus indicus* sp. nov.: Dorsal and Ventral views. Figs. 3-4. *Physa acuta* Draparnaud: Dorsal and Ventral views.

various parts of India have drawn our attention, [Delhi (Dhanda 1959), Madras (Santhanakrishnan and Sundara Rajulu 1967), Raipur, M.P. (Srivastava and Arora 1969), Ratnagiri (Gaitonde *et al.* 1981)], the occurrence of *Bulinus* in India has to be viewed with concern. Further, the occurrence of *Physa acuta* in India is also a matter of concern, as many species of *Physa* transmit avian schistosomiasis (Malek and Cheng 1974).

Family: PLANORBIDAE
Genus: *Balinus* Mueller, 1781

***Bulinus indicus* sp. nov.**

Shell rather small, thin and light, imperforate, transparent to straw-coloured, sinistral, ovate with a large, inflated body

whorl; spire disproportionately short (approx. 1/4th total length of shell) being scarcely raised rather an obtuse apex. Whorls 4, abruptly increasing in size, sharply angulate at the sutures and distinctly shouldered, forming platform above. Sculpture consists of close, prominent transverse lamellae, decussated by irregular microscopic spiral markings; spiral markings more distinct in smaller shells. Aperture large, subquadrately elongate, rounded and expanded at base, scarcely reflected. Columella slightly twisted and has a weakly developed ridge.

AFFINITIES

The shells of *Bulinus indicus* show some affinities to the South African species, *B. abyssinicus* (Martens), *B. depressus* Hass and *B. tropicus* (Krauss) in its general appearance, but differs considerably from all of them. It differs from *B. abyssinicus* in having a broader aperture, the columellar twist being much less distinct and also in lacking the corrugated sculpture on the apical whorls. It differs from *B. depressus* in having a straighter columellar margin, and more distinctly angulate and more pronouncedly shouldered body whorl. It differs from *B. tropicus* in being short-spined and being less concave at the columellar region.

Family : PHYSIDAE

Genus : *Physa* Draparnaud, 1801

Material: 20 specimens, collected from a river at Manjri, Pune, Maharashtra during March and June, 1992.

Holotype: ZSI. Reg. No. M 23293/4

Paratype: 8 specimens, ZSI. Reg. No. M 23294/4

Measurements (in mm):

	Length	Diameter	Length of spire	Max. height of aperture
Holotype:	10.0	6.65	2.9	8.3
Paratypes:	4.35-9.65	2.4-6.2	1.5-2.4	3.6-8.18

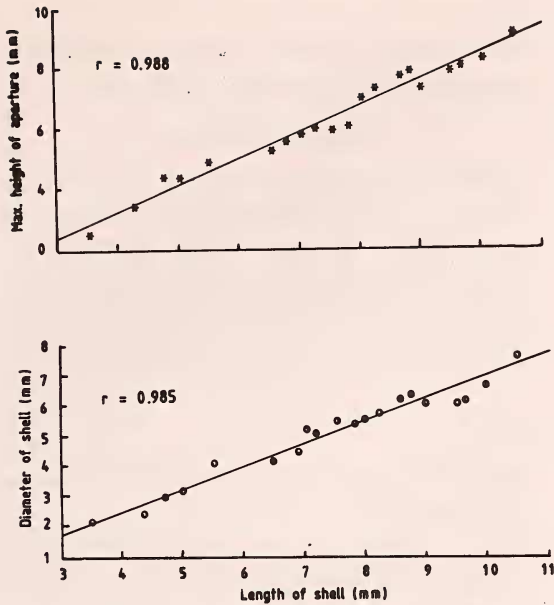


Fig. 5. Ratio of height of shell to diameter of shell and maximum height of aperture in *B. indicus*.

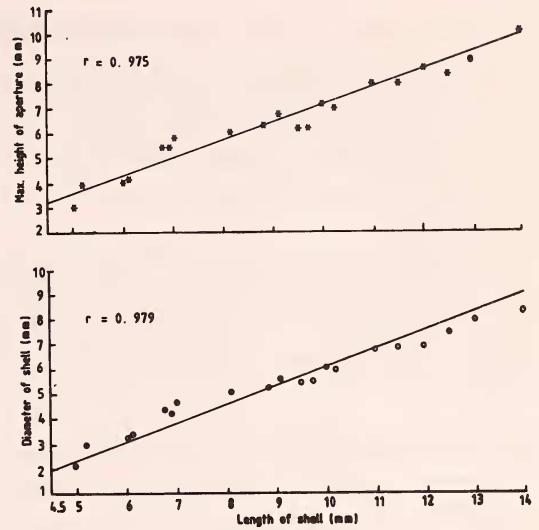


Fig. 6. Ratio of height of shell to diameter of shell and maximum height of aperture in *P. acuta*.

Distribution: The genus *Bulinus* is known from Africa, islands in the Indian Ocean, Iberia, Mediterranean islands and Southwest Asia (Brown 1980).

Habitat: Contrary to the record of many species of *Bulinus*, namely *B. jousseaumei*, *B. angolensis* and *B. natalensis* which show preference for stagnant water bodies or slow-flowing streams (Brown 1980), *B. indicus* was recorded from a fast flowing river. However, some species are known to occur in seasonal water bodies which remain dry for a considerable period in the year (Brown 1980). Some are recorded from roadside ditches, rice fields and also ponds and lakes. The present species was collected from a river.

Physa acuta Draparnaud

Shell of moderate size, ovate, fairly thick, imperforate, sinistral, glossy and smooth except for fine transverse growth striae, transparent, spire raised and pointed; whorls 6, rounded, body whorl large,

globose, sutures oblique; aperture oblong-ovate, outer lip thin, columella twisted, inner lip slightly thickened and expanded.

Tentacles long and slender, whitish in colour, foot and snout slate-coloured. Mantle with finger-like projections. Pseudobranch absent. Radular teeth in transvers oblique rows. Penis simple with a yellowish tip. Eggs are laid in irregularly rounded gelatinous masses inside which individual eggs are arranged in linear rows.

Material: 20 specimens, collected from river banks at Pimpri and a pond at Manjri, Pune, Maharashtra during March and June, 1992.

Measurements (in mm):

Length	Diameter	Maximum height of aperture
5.0-14.0	2.1-7.95	3.0-10.15

Distribution: A North American species introduced into Europe from where it reached Africa (Brown 1980); S.E. Asia (India and Pakistan).

Habitat: This snail has been observed to occur in streams, rivers, temporary ponds, stagnant water of temporary nature

and small, shallow water bodies along river banks, irrigation channels etc. It seems to prefer slightly polluted water and has difficulty in establishing itself away from human habitations (Brown 1980). Perhaps, this snail is well adapted to undergo anhydrobiosis.

It is obvious from figures 5 & 6 above that different shell parameters like length, diameter, height of aperture in both the species are correlated. Both the diameter

and maximum height of aperture are directly proportional to the length of the shell.

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